



Activity 8.1a - The BD Project

Purpose

Things move in predictable patterns. A ball thrown in the air moves in a curved path until it strikes the earth. We can analyze where it will strike the ground if we make some basic assumptions about free-fall acceleration and we discount the effects of wind resistance.

Materials

Scrap and recycled materials
Ping pong balls
Tape Measure
Excel[®]

Procedure

Objective: To create a device that will toss a ball accurately within a given range.

BD Constraints:

- Must be able to fire a projectile (to be specified by the instructor) anywhere within 5' to 15' operating range (design adjustability into your device!)
- Must fit within a 1'x1' footprint (in "collapsed form")
- Cannot utilize high-pressure gases or combustible materials
- Must be constructed primarily out of materials that are *found*, not bought.
- Must be sketched in engineering journals and approved by your instructor prior to building.

Testing:

- Performance Testing (after completion of final assembly and adjustment)
 - Choose at least ten firing angles between 10 and 80 degrees.
 - For each firing angle, fire the projectile and record range
 - Perform at least three trials for each firing angle
 - Record all procedures, tables, data etc. within engineering journals.
- Final Testing
 - Must be able to land in a 5-gallon bucket (the target) at a location specified by your instructor on the day of the test (and within the operating range)
 - Each team will have three tries to hit the target

